

Claims

1. An isolated DNA molecule that encodes a protein wherein the protein:
 - (a) comprises an amino-acid sequence selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 4, and SEQ ID NO: 6; or,
 - (b) comprises an amino-acid sequence wherein 1 or several amino acids are deleted, substituted, or added in an amino-acid sequence selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 4, and SEQ ID NO: 6, and has effects of controlling cell migration and cell death.
2. An isolated DNA molecule that comprises a base sequence selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 3, and SEQ ID NO: 5, a complementary sequence thereto, or a sequence comprising part or all of either of these sequences.
3. An isolated DNA molecule that hybridizes with the isolated DNA molecule of claim 2 under stringent conditions (e.g. 65°C and 0.1xSSC {1xSSC = 0.15 M NaCl, 0.015 M Na₃ Citrate pH 7.0). and which encodes at least one protein having the effects of controlling cell migration and cell death.
4. A protein that comprises:
 - (a) an amino-acid sequence selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 4, and SEQ ID NO: 6; or
 - (b) an amino-acid sequence wherein 1 or several amino acids are deleted, substituted, or added in an amino-acid sequence selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 4, and SEQ ID NO: 6, and which has effects of controlling cell migration and cell death.
5. The protein according to claim 4 wherein control of cell migration and cell

death is caused by the degradation of Filamin 1.

6. A peptide that comprises a part of the protein according to claim 4, wherein the peptide has the effects of controlling cell migration and cell death.

7. The peptide according to claim 6, wherein control of cell migration and cell death is caused by the degradation of Filamin 1.

8. A fusion protein wherein the protein according to claim 4 is bound to a marker protein.

9. A fusion peptide wherein the peptide according to claim 6 is bound to a peptide tag.

10. An antibody that specifically binds to the protein according to claim 4 or to a peptide that comprises a part of the protein according to claim 4, wherein the peptide has the effects of controlling cell migration and cell death.

11. The antibody according to claim 10, wherein the antibody is a monoclonal or a polyclonal antibody.

12. A recombinant protein or a recombinant peptide to which the antibody according to claim 10 specifically binds.

13. A host cell that comprises an expression system which is capable of expressing the protein according to claim 4 or a peptide that comprises a part of the protein according to claim 4, wherein the peptide has the effects of controlling cell migration and cell death.

14. A non-human animal whose gene function encoding the protein according to

claim 4 or a peptide that comprises a part of the protein according to claim 4, wherein the peptide has the effects of controlling cell migration and cell death, is deficient on its chromosome.

15. A non-human animal that over-expresses the protein according to claim 4 or a peptide that comprises a part of the protein according to claim 4, wherein the peptide has the effects of controlling cell migration and cell death.

16. The non-human animal according to claim 14 wherein the animal is a mouse or a rat.

17. The non-human animal according to claim 15 wherein the animal is a mouse or a rat.

18. A method for screening an inhibitor or a promoter of effects of controlling cell migration and/or cell death, or an inhibitor or a promoter of the expression of the protein according to claim 4 or of a peptide that comprises a part of the protein according to claim 4, wherein the peptide has the effects of controlling cell migration and cell death,

wherein a cell expressing the protein according to claim 4 or a peptide that comprises a part of the protein according to claim 4, wherein the peptide has the effects of controlling cell migration and cell death, and a test substance are used; or

wherein the protein according to claim 4, a peptide that comprises a part of the protein according to claim 4, wherein the peptide has the effects of controlling cell migration and cell death, or a cell membrane expressing the protein according to claim 10 or peptide that comprises a part of the protein according to claim 4, wherein the peptide has the effects of controlling cell migration and

cell death, and a test substance are used; or

wherein a non-human animal whose gene function encoding the protein according to claim 4 or a peptide that comprises a part of the protein according to claim 4, wherein the peptide has the effects of controlling cell migration and cell death, is deficient on its chromosome or a non-human animal that over-expresses the protein according to claim 4 or a peptide that comprises a part of the protein according to claim 4, wherein the peptide has the effects of controlling cell migration and cell death, and a test substance are used.

19. A promoter of effects of controlling cell migration and cell death obtained by the method for screening according to claim 18.

20. An inhibitor of effects of controlling cell migration and cell death obtained by the method for screening according to claim 18.

21. A promoter of the expression of the protein or peptide that comprises a part of the protein obtained by the method for screening according to claim 18.

22. An inhibitor of the protein or peptide that comprises a part of the protein obtained by the method for screening according to claim 18.

23. An inhibitor of metastasis of a cancer/a tumor, or a regulant of cell migration for transplantation treatment that includes the protein according to claim 4 or a peptide that comprises a part of the protein according to claim 4, wherein the peptide has the effects of controlling cell migration and cell death as an active ingredient.

24. An inhibitor of metastasis of a cancer/a tumor, or a regulant of cell migration for transplantation treatment that includes the recombinant protein or

the recombinant peptide according to claim 12 as an active ingredient.

25. An inhibitor of metastasis of a cancer/a tumor, or a regulant of cell migration for transplantation treatment that includes the antibody according to claim 10 as an active ingredient.

26. An inhibitor of metastasis of a cancer/a tumor, or a regulant of cell migration for transplantation treatment that includes the inhibitor of effects of controlling cell migration and cell death according to claim 20 as an active ingredient.

27. An inhibitor of metastasis of a cancer/a tumor, or a regulant of cell migration for transplantation treatment that includes the inhibitor of the expression according to claim 22 as an active ingredient.